Sympatric *Nepenthes* species in this area were: *N. ampullaria* Jack; *N. maxima* Reinw. ex Nees (from 400 m! alt. on); *N. mirabilis* (Lour.) Druce (hybrid with *N. insignis* observed at about 500 m alt.); *N. papuana* Dans. ? (determination is doubtfull, few plants found at 575 m alt.).

Danser already supposed that *N. insignis* would have a larger distribution - this is proven now. The species could be found on the island of Biak (Cenderawasih Bay) at about sealevel. The plants correspond in all respects but are generally somewhat smaller.

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Fig. 4. Pitchers of *N. insignis* Danser - an endemic species of New Guinea. Photo by H. Rischer

Want Ads

J. Yeo (60 Toh Tuck Road, #02 - 08, Singapore 2159, Tel/Fax 65-463-5538)
Would like to Correspond with fellow Nepenthes growers and swap Nepenthes seed.

TWO NEW SPECIES OF NEPENTHES FROM NORTH SUMATRA, INDONESIA

by
Bruce R. Salmon, 13 Rothery Road, Manurewa, Auckland 1702, New Zealand
Ricky G. Maulder, 59 Hutchinson Ave, New Lynn, Auckland 1007, New Zealand

SUMMARY

Two new species of *Nepenthes* (Nepenthaceae) from Gunung Pangulubau, North Sumatra, Indonesia are described and illustrated.

INTRODUCTION

In September 1989, while on a *Nepenthes* 'hunting' expedition to Sumatra, fellow traveller, Mike Hopkins and ourselves discovered 3 unique *Nepenthes* species on Gunung Pangulubau in North Sumatra. At the time only photos and plant material of each species was taken for our own private collections. Over the following years it became apparent to us that two of these three species were as yet undescribed. Representative specimens of each species were pressed for posterity and it was not until each species flowered that we felt typification was truely justified. All herbarium specimens and descriptions are from cultivated plants which we feel are reliable enough to be representative of their particular species. These have been deposited at the Auckland Institute and Museum Herbarium, (AK), Auckland, New Zealand.

G. Pangulubau has been climbed several times in the past by various botanists and carnivorous plant enthusiasts. In 1972, S. Kurata (1973:229-231), discovered *N. rhombicaulis* in the subalpine forest on its western slopes at 1700-1900m. More recently, *N. ovata* Nerz et Wistuba (1994:108-111), was described from a similar altitude and is one of the three unique species we saw on our expedition. Considering the relatively small area of G. Pangulubau, it seems remarkable that successive new *Nepenthes* species should reveal themselves to some explorers but remain undiscovered by those who journeyed there previously.

Nepenthes xiphioides Salmon et Maulder spec. nov.

Folia rosularum coriacea, semi-amplexicaulia, lanceolata, 40-50mm longa, 10-15mm lata, obtusa vel acuminata ad apicem, auriculata ad basim, sine vagina. Venae pennatae, irregulariter reticulatae; venae longitudinales 2 vel 3 utrinque, in laminae dimidio exteriore currentes; cirrhus tenuis, folio 2-3plo longior. Folia radicum brevium 140mm longa, 40mm lata. Folia caulis scandentis foliis rosulae similia, 70-120mm longa, 15-30mm lata; cirrhi longitudinem foliorum aequantes, ascidiis nullis. Ascidia rosularum et brachyblastorum, 40-55mm celsa, 15-20mm lata, ovata-ellipsoidea in $^2/_5$ inferioribus, parum decrescentia sub ore, ellipsoidea super partem angustam, duobus alis fimbriatis per longitudinem totam. Alae 1-2mm latae, segmenta fimbriarum filiformia, 2-4mm longae; os obliquissimum, ovatum, acuescens versus operculum; peristomium rotundatum, 1.5-2mm latum antice, complanescens et ibi latissimum, 2.5-3.5mm in $^1/_3$ superiore costis 0.3-0.6mm distantibus, 6-8plo longioribus quam latis, pectinatum; ascidii pagina interior, glandulosa in $^2/_3$ inferioribus, glandibus minutis superfornicatis ellipticis vel rotundis, in $^1/_3$ superiore pruinosis absque glandibus. Ascidii operculum ovatum, 10-20mm longum, 8-15mm latum, cordatum ad basim, rotundatum ad apicem, pagina inferiore glandulosa glandibus ellipticis vel rotundis, profundis, margine praeditis; nervus centralis ut maximum obtuse carinatus, calcar filiforme, complanatum, 1-2mm longum. Ascidia caulis scandentis nulla. Inflorescentia mascula racemus rectus 135-220mm longus floribus 45-70; pedicelli uniflori sed cum nonnullis pedicellis bifloribus in $^1/_3$ inferiore, 3-14mm longi. Tepala ovata et reflexa; indumentum rarissimum in partibus maturis, caulibus et foliis glabris; ascidia capillis brevibus dendriticis et stellatis tecta. Operculi capilli in superiore et inferiore paginis,

stellati. Pedunculi superior pars, axis, pedicelli, tepali margines capillis brevibus appressis filiformibus teguntur; tepali pagina exterior et columna staminalis glabrae. **Holotypus:** B. Salmon & R. Maulder, 221720, vine with male inflorescence, lower pitcher, rosette with pitchers. N. Sumatra, East side of Lake Toba, Gunung Pangulubau, 1900m alt., 17. Feb. 1995(AK).

Stems, prostrate or climbing, up to 2m long, cylindrical 4-5mm wide with many small rosettes and short shoots at the base, sometimes adventitious underground stems produce rosettes away from the main plant; internodes 20-40mm long. Leaves of the rosettes, coriaceous, semi-amplexicaul, lanceolate 40-50mm long, 10-15 mm wide, obtuse to acuminate at the apex, auriculate at the base clasping the stem for $^2/_3$ the diameter. Pennate veins, irregularly reticulate, running obliquely to the margin; longitudinal veins, 2 or 3 on each side, running in the outer $^1/_2$ of the blade; originating from the midrib near the base of the leaf, converging at the tip. Tendril, slender 1.5mm wide, 2-3 X as long as the leaf, descending without curl. Leaves of the short shoots often larger than those of the rosette and climbing stem, 140mm long, 40mm wide. Leaves of the climbing stem similar to those of the rosette, 70-120mm long, 15-30mm wide; leaves tending to reduce in size as the stem grows longer. Tendrils the same length as the leaves, slender, 1mm wide, straight without curl and bearing no pitchers. Pitchers of the rosettes, abruptly incurved at the front or side from the hanging end of the tendril, 40-55mm tall, 15-20mm wide, ovate-ellipsoidal in the lower $^2/_5$ narrowing slightly about 5mm below the mouth, ellipsoidal at the back and above the narrow part with 2 fringed wings over the entire length. Wings 1-2mm wide, fringe segments filiform, 2-4mm long, and 8-14 fringe segments per cm. Mouth, very oblique, elevated towards the lid, ovate becoming acute towards the lid with almost no neck; peristome, rounded 1.5-2mm wide in front becoming flattened and widest, 2.5-3.5mm in the upper $^1/_3$ with ribs 0.3-0.6mm apart, 6-8 X as long as wide on the inner margin, pectinate. Inner surface of the pitcher, glandular in the lower $^2/_3$ with minute elliptic to rotund overarched glands 0.15-0.3mm long, the long axis of the glands orientated at right angles to the long axis of the pitcher; from the bottom to the top 400-600 glands per cm^2, glands becoming larger and more rotund towards the bottom of the pitcher; the upper $^1/_3$ glandless and pruinose. Pitcher lid, ovate 10-20mm long, 8-15mm wide, cordate at the base, rounded at the apex, the lower surface glandular, with elliptic to rotund, deepened and rimmed glands 0.1-0.4mm long, the long axis of the glands orientated with the long axis of the lid; midrib at most obtusely carinate, the glands situated on either side becoming more concentrated towards the base with a glandless band around the margin of the lid; spur filiform, flattened 1-2mm long, singular or forked once, inserted at the base of the lid. Pitchers of the short shoots, similar to those of the rosette. Pitchers of the climbing stem, non-existant. Male inflorescence an erect raceme, peduncle cylindrical 45-80mm long, 3.5-5mm wide; axis, slightly angular, gradually tapering towards the tip 90-140mm long bearing approximately 45-70 flowers; pedicels, situated in one whorl and an apical group, 1 flowered but bearing some 2 flowered pedicels in the lower $^1/_3$ with a 1-4mm long bract at their base; bracts becoming smaller towards the axis tip. Inter-pedicel length 4-9mm; single flowered pedicel bases 1mm broad, 3mm long near the top of the axis, 14mm long near the bottom; 2 flowered bases 1-1.5mm broad, 2-3mm long; arms 5-7mm long. Tepals ovate and cupped 3-3.5mm long, 2-2.5mm wide, reflexed; inner surface glandular, glands elliptic to rotund 0.1-0.25mm long, the long axis of the glands orientated with the long axis of the tepal; staminal column including the anther 3.5-5.5mm long, the shorter staminal columns near the top of the axis. Female inflorescence, unknown. Indumentum, very sparse on mature parts, the stems and leaves glabrous; tendrils glabrous becoming slightly hairy towards their tips. Immature pitchers covered with short filiform, tomentose hairs; mature pitchers retain these hairs which are abundantly

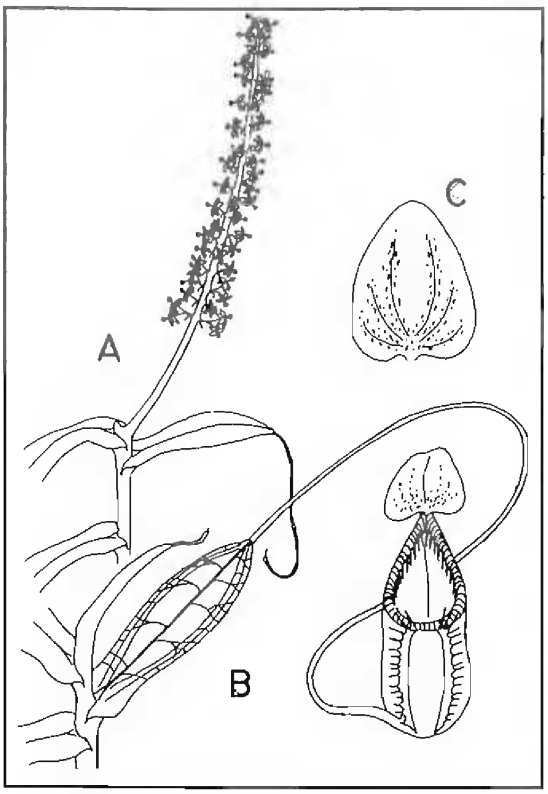

Fig. 1 -- Nepenthes xiphioides sp. nov. A. Male inflorescence. B. Rosette of leaves and anterior view of lower pitcher. C. Lower surface of lid. See article in this issue

Fig. 2 -- Nepenthes xiphioides sp. nov. Plant in cultivation. See article in this issue

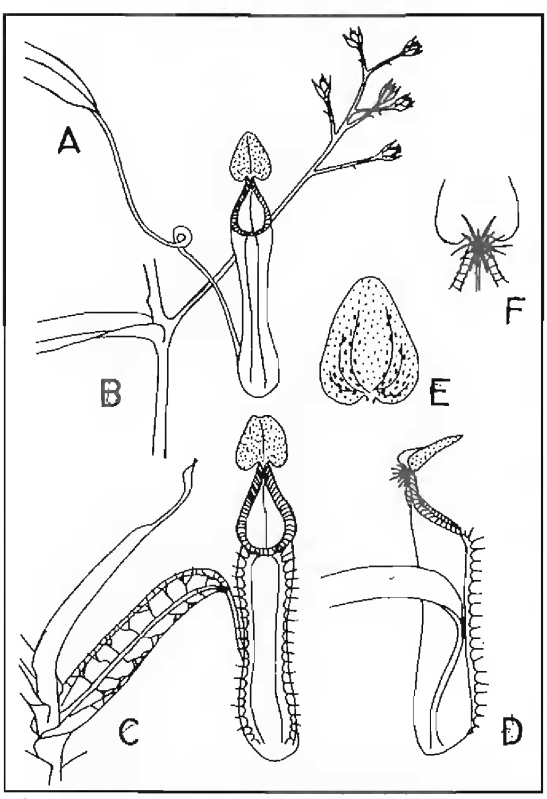

Fig. 3 -- Nepenthes mikei sp. nov. A. Upper pitcher. B. Female inflorescence. C. Lower pitcher and leaf anterior view. D. Lower pitcher lateral view. E. Lower surface of lid. F. Detail of lower pitcher spur posterior view. See article in this issue

Fig. 4 -- Nepenthes mikei sp. nov. Cultivated plant. See article in this issue

scattered over it's entirety; the hairs are of 2 types, dendritic 0.8mm long and stellate 0.3mm long. Lid hairs on both upper and lower surfaces, stellate 0.05-0.1mm long; longest and most concentrated near the ribs. The upper part of the peduncle, axis, pedicels and tepel margins covered with short appressed filiform hairs 0.2-0.5mm long; outer surface of tepal and staminal column glabrous.

Colour: Colour of herbarium specimens: Light brown. Colour of living specimens: Stems dull red; leaves, glossy green above, lighter below; midrib of lower leaves, dull red above and below; midrib of upper leaves, dull red above, yellowish green below; tendrils green to reddish yellow. The rosette pitchers, yellow or green with dull red markings outside; the inner surface, yellowish green in the glandular part, purple in the pruinose part; peristome, yellow, sometimes tinged with red; lid, yellow with red markings above, light yellow below. Inflorescence, yellowish green. Indumentum, brownish.

Distribution:

North Sumatra, Indonesia, Gunung Pangulubau, 1800-1900m altitude.

Ecology:

First discovered in September 1989, this species was observed and collected from wet mossy forest on a very steep ridge near the top of G. Pangulubau, a high peak in the range of mountains on the Eastern side of Lake Toba, North Sumatra. The plants were growing in peaty humus or moss in a very open and exposed position, characterized by stunted trees only a few metres tall. Plants were either prostrate or climbing up the trees and shrubs but not more than 2m. Most plants had many rosettes or short shoots at their base. Adventitious, underground stems also produced rosettes away from the main plant. Plants were found flowering when only 30cm tall and all climbing stems lacked upper pitchers. *N. xiphioides* spec. nov. formed natural hybrids with *N. ovata* and *N. mikei* spec. nov. Although *N. xiphioides* spec. nov. was only found at this one location, it is most likely to occur in other suitable habitats along this mountain range, to which it is probably endemic.

Derivation:

The specific epithet *xiphioides,* from the Latin (*xiph*) a sword and (*oides*) resembling; refers to the long, thin teeth of the inner margin of the peristome. It has been known to a few growers as *N. rancing* nom. nud., which is the Indonesian equivalent of it's Latin name. The name *N. rancing* nom. nud. has never been published, therefore it is invalid.

Notes:

Although no single feature of this new taxon is diagnostic, the combination of features are unique. Specifically the consistently small size of the pitchers, the length of the teeth on the inner margin of the peristome, the absence of aerial pitchers and the long tendrils of the rosette leaves. These features and its geographical isolation from other known populations of *N. gymnamphora*, clearly distinguishes this species from *N. gymnamphora*. After comparing *N. xiphioides* spec. nov. with three live specimens of *N. gymnamphora*, one from G. Telaga in Java and the other two from G. Tanggamus and G. Talang in Sumatra, the following differences were noted and are set out in Table 1. Descriptions of *N. gymnamphora,* Danser, 1928:(300-306) and *N. melamphora,* Macfarlane 1908:(56-57) were also taken into account.

Table 1.
Characteristics of *N. xiphioides* spec. nov. compared to its nearest relative *N. gymnamphora*.

	N. xiphioides	N. gymnamphora
Longitudinal leaf veins	2-3 running in outer $^1/_2$ of blade	3-6 running in outer $^2/_3$-$^4/_5$ of blade
Leaf margins	glabrous	covered with short dense hair
Rosette leaf tendril	2-3 X as long as the leaf	about as long as the pitcher
Rosette pitchers	4-5.5cm tall 1.5-2cm broad	8-12cm tall 3-4cm broad
Aerial pitchers	absent	present*
Peristome teeth	6-8 X as long as broad	3-6 X as long as broad
Inflorescence	1 flowered but bearing some 2 flowered pedicels in lower $^1/_3$	mostly 2 flowered, upper most ones 1 flowered; rarely most or all of them 1 flowered
Staminal column	glabrous	hairy at base or over whole length

* From personal experience, *N. gymnamphora* forms from West Sumatra are less likely to have upper pitchers than those forms from Java.

Specimens examined:

Nepenthes xiphioides: B. Salmon & R. Maulder, 221720 (Holotype), vine with male inflorescence, lower pitcher, rosette with pitchers. N. Sumatra, East side of Lake Toba, Gunung Pangulubau, 1900m alt., 17.Feb.1995 (AK).

Nepenthes mikei Salmon et Maulder spec. nov.

Folia rosularum coriacea, sessilia, linearia, 50-70mm longa, 9-12mm lata, obtusa ad apicem, abrupte contracta ad basim, sine vagina. Venae pennatae irregulariter reticulatae; venae longitudinales 1 vel 2 utrinque, in laminae dimidio exteriore currentes; cirrhi tenues, folii longitudinem aequantes. Folia caulis scandentis foliis rosulae similia; cirrhi 1 $^1/_2$-2plo longiores quam folium, simpliciter crispati. Ascidia rosularum, 60-80mm longa, 10-20mm lata, a fronte angustissima, ovata-ellipsoidea in $^1/_3$ inferiore, in media parte decrescentia ad formam tubi, infundibuliformia in $^1/_3$ superiore, parum decrescentia versus os 2 alis fimbriatis per totam longitudinem currentibus. Alae 1-2mm latae, marginis segmenta filiformia, 1-2mm longa; os obliquum, ovatum, parum acuescens versus operculum; peristomium rotundatum, 1-1.5mm latum antice, 2.5-3.5mm latum versus operculum; costae 0.2-0.4mm distantes, tam longae quam latae; ascidii pagina interior glandulosa in $^1/_4$ inferiore glandibus minutis rotundis elevatis et convexis, in $^3/_4$ superioribus pruinosa glandulis nullis. Ascidii operculum ovatum, 10-20mm longum, 8-18mm latum, reniforme ad basim, rotundum ad apicem; pagina inferior glandulosa glandibus minutis rotundis elatis convexis; nervus centralis ut maximum obtuse carinatus. Calcar fasciculatum, segmentis usque ad 12, 3-7mm longum. Ascidia caulis scandentis omnino minora; alae ad costas redactae, nullis appendicibus filiformibus; calcar bis vel ter ramosum, 4-6mm longum. Inflorescentia feminea racemus semi-horizontalis; pedicelli uniflori 4-10 floribus, 6-15mm longi. Tepala lanceolata non late patentia; indumentum rarissimum in partibus maturis, caulibus et foliis glabris; cirrhi et ascidia capillis brevibus filiformibus dendriticus stellatis tecta. Operculi capilli stellati, profusi in pagina superiore, pagina inferior glabra; pedunculus, pedicelli, tepali margines, ovarium capillis brevibus filiformibus appressis tecta; tepalorum pagina exterior glabra et verrucosa.

Holotypus: B. Salmon & R. Maulder, 221719, vine with female inflorescence, lower pitcher, rosette. N. Sumatra, East side of Lake Toba, Gunung Pangulubau, 2000m alt., 17.Feb.1995(AK).

Stems; climbing, up to 7m long, cylindrical, 2-3mm broad with a few rosettes and short shoots at the base, occasionally branching in the woody parts, beginning with small rosettes which eventually become shoots; internodes, 50-90mm long. Leaves of the rosettes, coriaceous, sessile, linear, 50-70mm long, 9-12mm wide, obtuse at the apex, abruptly contracted at the base clasping the stem for $^1/_2$ the diameter. Pennate veins irregularly reticulate, running obliquely to the margin; longitudinal veins, 1 or 2 on each side, running in the outer $^1/_2$ of the blade; originating from the midrib near the base of the leaf converging at the tip. Tendrils, slender, 1-1.5mm wide, approximately the same length as the leaf, descending without curl. Leaves of the short shoots, similar to those of the rosette. Leaves of the climbing stem, similar to those of the rosette; tendrils, $1^1/_2$ -2 X as long as the leaf, bearing pitchers with a simple curl. Pitchers of the rosettes, abruptly incurved at the front or side from the hanging end of the tendril, 60-80mm long, 10-20mm wide, narrowest from the front, ovate-ellipsoidal in the lower $^1/_3$, narrowing in the central part to become tubular, infundibuliform in the upper $^1/_3$, narrowing slightly towards the mouth with 2 fringed wings running the entire length. Wings, 1-2mm wide, fringe segments filiform, 1-2mm long and 4-8 fringe segments per cm. Mouth, oblique, elevated towards the lid, ovate becoming slightly acute towards the lid with almost no neck; peristome, rounded, 1-1.5mm wide in front, 2.5-3.5mm wide near the lid; ribs, 0.2-0.4mm apart, as long as wide on the inner margin; inner surface of the pitcher, glandular in the lower $^1/_4$ with minute raised and convex, rotund glands, 0.2-0.3mm long; from the bottom to the top about 150-180 glands per cm^2 glands becoming larger and fewer towards the bottom with the upper $^3/_4$ glandless and pruinose. Pitcher lid, ovate 10-20mm long, 8-18mm wide, reniform at the base, rounded at the apex; the lower surface glandular with minute raised and convex, rotund glands, 0.1-0.2mm long, evenly distributed over the entire surface, approximately 40 per cm^2; the midrib at most obtusely carinate. Spur, fasciculate, up to 12 segments, 3-7mm long, inserted at the base of the lid. Pitchers of the short shoots, similar to those of the rosette, abruptly incurved at the side from the hanging end of the tendril, facing outwards from the stem. Pitchers of the climbing stem, similar to those of the rosette and short shoots but generally slightly smaller in all respects; gradually incurved at the back from the hanging end of the tendril with a 2.5-3.5mm curve; wings reduced to ribs, 0.5mm wide with no filiform appendages; spur, branched 2-3 times, 4-6mm long. Male inflorescence, unknown. Female inflorescence, a semi-horizontal raceme; peduncle, cylindrical, 25-45mm long, 0.8-1.2mm wide; axis gradually tapering towards the tip, 15-35mm long bearing approximately 4-10 flowers. Pedicels situated in a whorl, 1 flowered with a 1-1.5mm long bract protruding from about $^1/_2$ way up the pedicel; inter- pedicel length 3-9mm; pedicel bases, 0.5-1mm broad, 6mm long near the top of the axis, 15mm long near the bottom. Tepals, lanceolate, cupped, 3-4mm long, 1-1.5mm wide, not opening widely; inner surface glandular, glands elliptic to rotund , 0.1mm long, the long axis of the glands being orientated with the long axis of the tepal; stigma 3.5-4mm long, 1.5-2mm wide being shortest near the top of the axis. Indumentum very sparse on mature parts, the stems and leaves glabrous; tendrils covered with filiform to dendritic hairs, 0.2-0.5mm long; immature pitchers covered with short filiform, tomentose hairs; mature pitchers retain these hairs which are abundantly scattered over its entirety. The hairs are of 2 types; filiform to dendritic hairs, 0.4-0.7mm long, which are quite sparse, and stellate hairs, 0.05-0.1mm long which are profuse over the pitcher surface. Lid hairs, profuse on the upper surface, lower surface glabrous; stellate, 0.05-0.1mm long, longest and most concentrated near the ribs; spur also with short dendritic and stellate hairs. The peduncle, pedicels, tepal margins and ovary covered with short filiform appressed hairs, 0.05-0.3mm long; outer surface of tepals, glabrous and warty.

Colour: Colour of herbarium specimens: Blackish. Colour of living specimens. Stems,

blackish; leaves, glossy green above, lighter below; midrib green; tendrils blackish. Rosette pitchers, yellowish green heavily marked with black outside; inner surface, green in the glandular part, whitish green in the pruinose part; lid, yellowish green with black markings above, green below; peristome, green to yellowish green, sometimes tinged with black. Upper pitchers similar to lowers. Inflorescence, blackish. Indumentum, white.

Distribution:

North Sumatra, Indonesia, Gunung Pangulubau, 1900-2000m altitude.

Ecology:

First discovered in September 1989, this species was observed and collected from a very steep ridge in wet mossy forest near the top of G. Pangulubau, a high peak in the range of mountains on the Eastern side of Lake Toba, North Sumatra. The plants were growing in peaty humus or moss at the base of 5-6m tall trees, in association with other *Nepenthes* species; *N. ovata, N. spectabilis and N. xiphioides* spec. nov. Numerous natural hybrids occured between all four. *N. xiphioides* spec. nov. grew in the open in an adjacent habitat while *N. rhombicaulis* grew in denser forest 100m lower. *N. mikei* spec. nov. bears little resemblance to any of these species so is therefore unlikely to be a hybrid. Although this new taxon was only found at this one location, it is likely to occur throughout this mountain range in other suitable habitats, and is probably endemic to this area.

Derivation:

The specific epithet *Mikei* refers to the late Mike Hopkins. This new taxon is named in his honour as he accompanied us on a number of expeditions to S. E. Asia and was a co-discoverer of this species. *N. mikei* spec. nov. has been known to a few growers as *N. minutissima* nom. nud. but this name was never published so it is invalid.

Notes:

Nepenthes mikei spec. nov. is very clearly distinct from the related species, *N. tobaica, N. tentaculata* and *N. adnata*. It is most easily recognized by the fasciculate spur on the lower pitchers.

Table 2.

Characteristics of *N. mikei* spec. nov. compared to related species.

	N. mikei	N. tobaica	N. tentaculata	N. adnata
Leaf base	abruptly contracted	rounded or slightly amplexicaul	very oblique almost decurrent, cordate	shortly decurrent
Longitudinal leaf veins	1 or 2 running in outer $^1/_2$ of blade	sometimes 1, rarely 2	2-8 usually 4 running in outer $^2/_3$-$^3/_4$ of blade	3-4 on each side
Spur	fasciculate, lowers branched 2-3 X, uppers	filiform, not branched	flattened, not branched	—
Inflorescence	1 flowered	2 flowered	1 flowered	1 flowered
Pedicel bract	half way up pedicel	bracts absent	bracts absent	—

Specimens examined:

Nepenthes mikei: B. Salmon & R. Maulder, 221719 (Holotype), vine with female inflorescence, lower pitcher, rosette. N. Sumatra, East side of Lake Toba, Gunung

Pangulubau, 2000m alt., 17.Feb.1995 (AK); *N. mikei*: B. Salmon & R. Maulder, 221718, two upper pitchers, short shoot with pitchers, two lower pitchers. N. Sumatra, East side of Lake Toba, G. Pangulubau, 2000m alt., 17.Feb.1995 (AK).

Acknowledgements:
We would like to thank Ewen Cameron and the staff of the Auckland Institute and Museum Herbarium for their help with preparation of specimens and Dr. Will Richardson from the University of Auckland Classics Department for his Latin translation of our descriptions.

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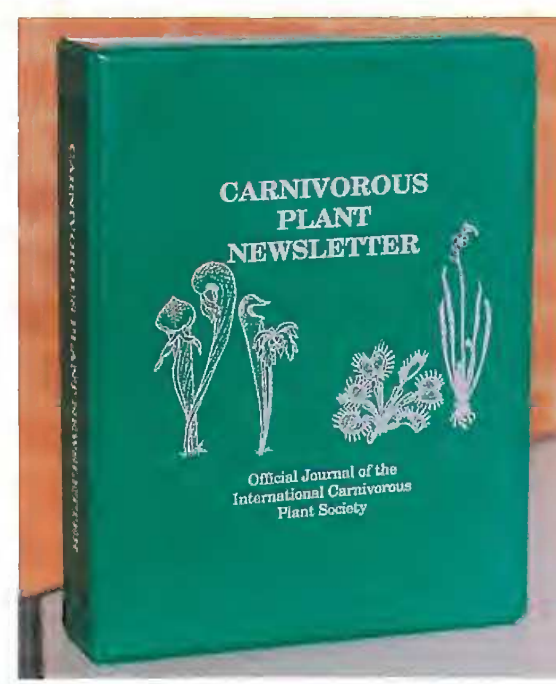

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